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09/310,256	05/12/1999	SHENG-CHI CHIN	TSMC98-574	8566

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EXAMINER

AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/22/2005

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 20050307

Application Number: 09/310,256  
Filing Date: May 12, 1999  
Appellant(s): CHIN ET AL.

Stephen B. Ackerman  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 1/6/05.

**Remarks**

The substitute appeal brief filed 1/6/05 resolves the issue raised by the board of appeals dated 6/26/03, wherein the clarification of the marked up version of claims of dated may 24, 2001 is discussed at page 1 of the appeal brief.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The amendment after final rejection filed on 10/29/01 has not been entered.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Claims 16-22 is now indicating allowable.

Applicant's argument to claims 16-22 are persuasive and accordingly, the rejection to claims 16-22 is withdrawn.

The applied prior art does not teach a process of reducing particle count at the end of power-down for an ICP dry-etch cleaning chamber by introducing oxygen gas with specified pressure and power level for each of the six steps of the power-down procedure.

**(7) Grouping of Claims**

The appellant's statement in the brief that claims 1-15 stands or fall together.

It is noted that claims 16-22 are indicated allowable.

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5,221,425

BLANCHARD et al

6-1993

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claim 1- 3 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Blanchard et al (USP 5,221,425).

Blanchard et al disclose a method for reducing the foreign particles during a reactive ion etching process by gradually reducing the radio frequency (RF) voltage to a minimum voltage in a series of steps (col.2, lines 19-40 and 60-68).

Blanchard et al also disclose that gradually reducing the RF voltage to zero results in the least amount of foreign matter onto the substrate and the reduction of the power is done by incrementally reducing the power in a series of steps, wherein at least

Art Unit: 1765

five steps are used to reduce the power to test five groups of substrates for measuring the content of the foreign particles (col.5, lines 34-43 and lines 64-col.6, lines 2).

Blanchard et al further, disclose that the plasma gases can be removed from the chamber by means of a vacuum pump (col.4, lines 48-51).

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard et al (USP 5,221,425).

Blanchard et al discussed in the above paragraph but Blanchard et al do not disclose that the reactive ion etch (RIE) chamber could be inductive coupled plasma (ICP) dry-etch chamber.

Blanchard et al's method includes gradually reducing the RF voltage applied to the cathode. So, it would have been obvious to one skill in the art to use ICP dry-etch chamber because it would provide the same benefit.

**(11) *Response to Argument***

Applicants argue that Blanchard et al differs from the instant application on the ground that Blanchard et al teach a method for reducing foreign matter deposited on a substrate during reactive ion etching, whereas, the instant application disclose a method of reducing dry- etch chamber particle count at the end of power-down for a dry-etch chamber.

This is not persuasive because Blanchard et al disclose a process for reducing foreign particles on a substrate to be processed, wherein the power is down to zero in such a manner that particle count is reduced at the end of the power-down process.

Art Unit: 1765

Blanchard et al, further disclose that the power down procedure starts after the etching process (col.5, lines 54-col.6, lines 2).

So, Blanchard et al inherently teach that the particle count is reduced in the dry-etch chamber because the substrate is positioned in the chamber.

Examiner also states that foreign particles will deposit on both the substrate and the dry-etch chamber during RIE process because the substrate is within the chamber during the etching process and the power-down procedure starts after the etching process.

As a result, the foreign particles are reduced on the surface on the substrate and at the same time the dry-etch chamber also have reduced foreign particle count because the substrate is processed on the chamber.

Applicants also argue that Blanchard et al do not teach the power-down is performed in a controlled and gradual manner, which is not persuasive because Blanchard et al teach that the reduction of the power is performed in a controlled and gradual manner (col.5, lines 64-col.6, lines 2).

Blanchard et al also teach that the particles count reduces at the end of the power-down procedure (col.6, lines 32-40).

In conclusion, examiner states that Blanchard et al disclose a similar process to reduce particle count on the surface of a substrate as well as the dry-etch chamber using a power-down procedure in such a manner that the power or the voltage is gradually reduced to a minimum value, wherein the power-down procedure is a subsequent process of the RIE processing (see claims 1-4).

Art Unit: 1765

For the above reasons, it is believed that the rejection to claims 1-15 should be sustained.

- Respectfully submitted,

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March 7, 2005

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